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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,449	09/22/2003	Alfred Weber	SCH-1743 C1	6844

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EXAMINER	
KAM, CHIH MIN	

ART UNIT	PAPER NUMBER
1656	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/665,449	WEBER ET AL.	
	Examiner	Art Unit	
	CHIH-MIN KAM	1656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *54-56,61-63,68-70,73,74 and 77-83* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *54-56,61-63,68-70,73,74 and 77-83* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/509,608.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The Request for Continued Examination (RCE) filed on January 23, 2009 under 37 CFR 1.114 is acknowledged. An action on the RCE follows.

Status of the Claims

2. Claims 54-56, 61-63, 68-70, 73-74 and 77-83 are pending.

Applicants' amendment filed January 23, 2009 is acknowledged. Applicant's response has been fully considered. Claims 54-56, 61, 62, 68-70 and 77 have been amended, and claim 60 has been cancelled. Therefore, claims 54-56, 61-63, 68-70, 73-74 and 77-83 are examined.

Withdrawn Claim Rejections - 35 USC § 112

3. The previous rejection of claim 60 under 35 U.S.C. 112, first paragraph, written description, is withdrawn in view of applicants' cancellation of the claim in the amendment filed January 23, 2009.

Maintained Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 54-56, 61-63, 68-70, 73-74 and 77-83 remain rejected under 35 U.S.C. § 112, first paragraph, written description, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The instant claims are drawn to yeast strains and expression cassettes containing genes defined only by the enzyme they encode, wherein the enzyme is defined only be name, which name is indicative of a function. The instant claims are also drawn to methods of producing ergosterol or an intermediate product thereof using genes in altered form that are defined only by function.

The Court of Appeals for the Federal Circuit has recently held that a "written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as be structure, formula [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials." University of California v. Eli Lilly and Co., 1997 U.S. App. LEXIS 18221, at *23, quoting Fiers v. Revel, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993) (bracketed material in original). To fully describe a genus of genetic material, which is a chemical compound, applicants must (1) fully describe at least one species of the claimed genus sufficient to represent said genus whereby a skilled artisan, in view of the prior art, could predict the structure of other species encompassed by the claimed genus and (2) identify the common characteristics of the claimed molecules, e.g., structure, physical and/or chemical characteristics, functional characteristics when coupled with a known or disclosed correlation between function and structure, or a combination of these.

The instant specification describes the genes to be used in the claimed methods by virtue of function alone. No structures, other than specific species of genes (i.e., the genes in S. cerevisiae (yeast); page 2, paragraph 1) are described. No relation between the structure of the species (i.e., genes in altered form) and function is described. The specification merely indicates that for HMG1 gene, "altered" means that of the corresponding genes, only the catalytic area is

expressed without the membrane-bound domains (See EP-0486290; page 9, first full paragraph). However, there is no description regarding the altered form of ERG9, SAT1 and ERG1 genes. Thus, one of skill in the art would be required to predict new genes for use in the claimed methods based solely on their function, or the function of their encoded proteins. Such methods would not be predictably considering the minimal structural information provided in the specification. The lack of description on structure and function relationship for the genes (i.e., in altered form) encoding the enzymes, and lack of representative species as encompassed by the claims, applicants have failed to sufficiently describe the claimed invention, in such full, clear, concise terms that a skilled artisan would not recognize applicants were in possession of the claimed invention.

Response to Arguments

Applicants indicate claim 82 was not rejected under any section, nor objected to in the present Office Action, thus claims 82 and 83 should have been listed as allowable under item 5 of the Office Action Summary. Applicants also indicate that since claims 82 was not rejected, claims 55, 56, 61, 62 and 67 have been made dependent on claim 82, and claim 54 has been amended to recite the aspects of the allowed claim. Claims 68-70 have been amended to recite yeast genes, and in the instant application, the disclosure of representative species, for example, *S. ceredsiae* ADH1, which fall within the claimed genus of yeast ADH1, provides more than an adequate written description of the claimed molecules. Applicants further indicate that the present claims conform to exemplary claim 2 of Example 15 at page 51 of the PTO's new *Written Description Guidelines Training Materials* (Rev. 1, March 25, 2008) regarding the genus with widely varying species. Since the instant claims are directed to yeast genes of the ergesterol

metabolic pathway and insofar as the sequences are disclosed and known, the subject matter of Applicants' claims is analogous to the exemplary claim 2 of the guidelines. The guidelines explicitly state that the subject matter of the claim (i.e., mouse squeaker protein) is adequately described. To sustain this rejection would thus inconsistent with the USPTO's own published guidelines. Therefore, the rejection should be withdrawn (pages 9-11 of the response).

Applicants' response has been fully considered, however, the arguments are not found persuasive because of the following reasons. First, claims 82-83 are also rejected under 35 U.S.C. § 112, first paragraph, written description, in the Office Action dated 10/24/2008, please see the last sentence in paragraph 2 (i.e., new claims 82-83 are added to the rejection). While the genes of *S. cerevisiae* (yeast) were known in the art (see also page 2, ¶1 of the specification) prior to the filing date of the instant application, the claims, which are directed to suitable genes (either yeast or other microorganisms) in altered forms, encompass altered genes of t-HMG, ERG9, ERG1 and SAT1 from various species of yeast or other microorganisms. Although the specification and the art describe the wild-type genes of t-HMG, ERG9, ERG1 and SAT1 of *S. cerevisiae,* a specific altered t-HMG gene, and ADH1 promoter, neither the specification nor the art discloses various altered genes of t-HMG, ERG9, ERG1 and SAT1 from different species of yeast or other microorganisms that encode the enzyme. Since there is no structure/function correlation for the altered genes of t-HMG, ERG9, ERG1 and SAT1, one of skill in the art could not predict the sequences of altered genes for use in the claimed methods based solely on their function, or the function of their encoded proteins. Regarding Example 15 at page 51 of the PTO's new *Written Description Guidelines Training Materials* (Rev. 1, March 25, 2008), the specification describes the nucleotide sequence of SEQ ID NO:1 which encodes a novel protein

refers to mouse squeaker protein, and the predicted amino acid sequence of SEQ ID NO:2. Since the specification describes the structure of mouse squeaker protein (SEQ ID NO:2), and the genetic codes provide a known correlation between function (encoding a specific amino acid) and structure (triple codons). Thus, one skilled in the art would be able to readily envisage many nucleic acid sequences that could encode SEQ ID NO:2. Therefore, the specification satisfies the written description with respect to claim 2, directed to the nucleotide acid sequence encoding mouse squeaker protein. However, this example is different from the instant claimed invention which encompasses genes of t-HMG, ERG9, ERG1 and SAT1 from various species of yeast or other microorganisms in altered forms (genus). The instant application does not provide the correlation between structure and function for the t-HMG, ERG9, ERG1 and SAT1 genes in altered form and representative species, one skilled in the art would not be able to predict the structure of the altered gene that encodes the enzyme. Thus, applicants have failed to sufficiently describe the claimed invention, and the rejection is maintained.

New Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 63 is rejected under 35 U.S.C. 102(b) as being anticipated by Hinnen *et al.* (Proc. Natl. Acad. Sci. USA 75, 1929-1933 (1978)) as evidenced by Weber *et al.* (US 2004/0235088).

Hinnen *et al.* teach *Saccharomyces cerevisiae* AH22 (*a leu2-3 Leu2-112 his4-519 can1*) has a leu2- double mutation constructed by recombining the leu2 alleles from stains 5463-8A (*a*

leu2-3 his4-519 can1) and ICR112 (*α leu2-3 Leu2-112*; page 1929, right column; page 1930, left column), which inherently contains one or more of yeast genes of the HMG-Co-A reductase, squalene synthetase, acyl-Co-A;sterol-acyltransferase and squalene epoxidase (claim 63), as evidenced by Weber *et al.*, which indicates the culture of AH22 has HMG-Co-A reductase activity (Table 1) and produces squalene and ergosterol (Tables 2 and 3).

Conclusions

6. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Min Kam whose telephone number is (571) 272-0948. The examiner can normally be reached on 8.00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon Weber can be reached at 571-272-0925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Chih-Min Kam/
Primary Examiner, Art Unit 1656

CMK

April 8, 2009